



SEQUENCE LISTING

<110> Nobuo SAKAGUCHI et al.

<120> ANTI-HIV ANTIBODY

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<160> 9

<170> PatentIn version 3.2

<210> 1

<211> 6429

<212> DNA

<213> Mus musculus

<220>

<221> CDS

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tct gga gca gtc cag tgg ctg atc tcc gga tgt cct caa gcc cta Ser Gly Ala Val Gln Trp Leu Ile Ser Gly Cys Pro Gln Ala Leu 1545 1550 1555	5054
gac ctt tgc tgc cag acc ctt gtt cag tat gtt gag gat ggg atc Asp Leu Cys Cys Gln Thr Leu Val Gln Tyr Val Glu Asp Gly Ile 1560 1565 1570	5099
agc cgc gag ttc agc cgt cgg ttt ttc cac gac agg aga gag agg Ser Arg Glu Phe Ser Arg Arg Phe Phe His Asp Arg Arg Glu Arg 1575 1580 1585	5144
cgc ctg gct agc ctg ccc tcc cag gag cct agc acc att att gag Arg Leu Ala Ser Leu Pro Ser Gln Glu Pro Ser Thr Ile Ile Glu 1590 1595 1600	5189

ttg ttc aac agt gtg ctg cag ttc ctg gcc tct gtg gta tcc tct	5234
Leu Phe Asn Ser Val Leu Gln Phe Leu Ala Ser Val Val Ser Ser	
1605 1610 1615	
gag cag ctg tgt gac atc tcc tgg cct gtc atg gaa ttt gcc gaa	5279
Glu Gln Leu Cys Asp Ile Ser Trp Pro Val Met Glu Phe Ala Glu	
1620 1625 1630	
gtg gga ggc agc cag ctg ctt cct cac ctg cac tgg aac tca cca	5324
Val Gly Gly Ser Gln Leu Leu Pro His Leu His Trp Asn Ser Pro	
1635 1640 1645	
gag cat cta gcg tgg ctg aaa caa gct gtg ctt ggg ttc cag ctt	5369
Glu His Leu Ala Trp Leu Lys Gln Ala Val Leu Gly Phe Gln Leu	
1650 1655 1660	
cca cag atg gac ctt cca ccc cca ggg gcc ccc tgg ctc cct gtg	5414
Pro Gln Met Asp Leu Pro Pro Pro Gly Ala Pro Trp Leu Pro Val	
1665 1670 1675	
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Cys Ser Met Val Ile Gln Tyr Thr Ser Gln Ile Pro Ser Ser Ser	
1680 1685 1690	
cag aca cag cct gtc ctc cag tcc cag gcg gag aac ctg ctg tgc	5504
Gln Thr Gln Pro Val Leu Gln Ser Gln Ala Glu Asn Leu Leu Cys	
1695 1700 1705	
aga aca tac cag aag tgg aag aac aag agc ctc tct cca ggc cag	5549
Arg Thr Tyr Gln Lys Trp Lys Asn Lys Ser Leu Ser Pro Gly Gln	
1710 1715 1720	
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Glu Leu Gly Pro Ser Val Ala Glu Ile Pro Trp Asp Asp Ile Ile	
1725 1730 1735	
acc tta tgc atc aat cat aag ctg agg gac tgg aca ccc ccc agg	5639
Thr Leu Cys Ile Asn His Lys Leu Arg Asp Trp Thr Pro Pro Arg	
1740 1745 1750	
ctc cct gtc aca tta gag gcg ctg agt gaa gat ggt caa ata tgt	5684
Leu Pro Val Thr Leu Glu Ala Leu Ser Glu Asp Gly Gln Ile Cys	
1755 1760 1765	
gtg tat ttt ttc aaa aac ctt tta aga aaa tac cac gtt ccc tcg	5729
Val Tyr Phe Phe Lys Asn Leu Leu Arg Lys Tyr His Val Pro Ser	
1770 1775 1780	
tca tgg gaa cag gcc aga atg cag acg cag cgg gaa ctg cag ctg	5774
Ser Trp Glu Gln Ala Arg Met Gln Thr Gln Arg Glu Leu Gln Leu	
1785 1790 1795	
agt cat gga cgt tcg ggg atg agg tcc atc cat cct cct aca agc	5819
Ser His Gly Arg Ser Gly Met Arg Ser Ile His Pro Pro Thr Ser	
1800 1805 1810	
act ttt cct act cca ttg ctt cat gta cac cag aaa ggg aag aaa	5864

Thr	Phe	Pro	Thr	Pro	Leu	Leu	His	Val	His	Gln	Lys	Gly	Lys	Lys	
		1815					1820					1825			
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Lys	Glu	Glu	Ser	Gly	Arg	Glu	Gly	Ser	Leu	Ser	Thr	Glu	Asp	Leu	
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ctg	cgg	ggg	gct	tct	gca	gaa	gag	ctc	ctg	gca	cag	agt	ctg	tcc	5954
Leu	Arg	Gly	Ala	Ser	Ala	Glu	Glu	Leu	Leu	Ala	Gln	Ser	Leu	Ser	
		1845					1850					1855			
agc	agt	ctt	ctg	gaa	gag	aag	gaa	gag	aac	aag	agg	ttt	gaa	gat	5999
Ser	Ser	Leu	Leu	Glu	Glu	Lys	Glu	Glu	Asn	Lys	Arg	Phe	Glu	Asp	
		1860					1865					1870			
caa	ctt	cag	cag	tgg	tta	tcg	caa	gac	tca	cag	gca	ttc	aca	gag	6044
Gln	Leu	Gln	Gln	Trp	Leu	Ser	Gln	Asp	Ser	Gln	Ala	Phe	Thr	Glu	
		1875					1880					1885			
tca	act	cgg	ctt	cct	ctc	tac	ctc	cct	cag	acg	cta	gtg	tcc	ttt	6089
Ser	Thr	Arg	Leu	Pro	Leu	Tyr	Leu	Pro	Gln	Thr	Leu	Val	Ser	Phe	
		1890					1895					1900			
cct	gat	tct	atc	aaa	act	cag	acc	atg	gtg	aaa	aca	tct	aca	agt	6134
Pro	Asp	Ser	Ile	Lys	Thr	Gln	Thr	Met	Val	Lys	Thr	Ser	Thr	Ser	
		1905					1910					1915			
cct	cag	aat	tca	gga	aca	gga	aag	cag	ttg	agg	ttc	tca	gag	gca	6179
Pro	Gln	Asn	Ser	Gly	Thr	Gly	Lys	Gln	Leu	Arg	Phe	Ser	Glu	Ala	
		1920					1925					1930			
tcc	ggt	tca	tcc	ctg	acg	gaa	aag	ctg	aag	ctc	ctg	gaa	agg	ctg	6224
Ser	Gly	Ser	Ser	Leu	Thr	Glu	Lys	Leu	Lys	Leu	Leu	Glu	Arg	Leu	
		1935					1940					1945			
atc	cag	agc	tca	agg	gcg	gaa	gaa	gca	gcc	tcc	gag	ctg	cac	ctc	6269
Ile	Gln	Ser	Ser	Arg	Ala	Glu	Glu	Ala	Ala	Ser	Glu	Leu	His	Leu	
		1950					1955					1960			
tct	gca	ctg	ctg	gag	atg	gtg	gac	atg	tag	ctgtctgacg	ggagacggat				6319
Ser	Ala	Leu	Leu	Glu	Met	Val	Asp	Met							
		1965					1970								
ctctaattca	taatgctttg	tctgtattca	attgtgttat	agatgctgtt	ggaaatgtga										6379
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 20 25 30

Phe Gly Gln Pro Ser Leu Phe Gly Gln Asn Ser Thr Pro Ser Lys Ser
 35 40 45

Leu Ala Phe Ser Gln Val Pro Ser Phe Ala Thr Pro Ser Gly Gly Ser
 50 55 60

His Ser Ser Ser Leu Pro Ala Phe Gly Leu Thr Gln Thr Ser Ser Val
 65 70 75 80

Gly Leu Phe Ser Ser Leu Glu Ser Thr Pro Ser Phe Ala Ala Thr Ser
 85 90 95

Ser Ser Ser Val Pro Gly Asn Thr Ala Phe Ser Phe Lys Ser Thr Ser
 100 105 110

Ser Val Gly Val Phe Pro Ser Gly Ala Thr Phe Gly Pro Glu Thr Gly
 115 120 125

Glu Val Ala Gly Ser Gly Phe Arg Lys Thr Glu Phe Lys Phe Lys Pro
 130 135 140

Leu Glu Asn Ala Val Phe Lys Pro Ile Pro Gly Pro Glu Ser Glu Pro
 145 150 155 160

Glu Lys Thr Gln Ser Gln Ile Ser Ser Gly Phe Phe Thr Phe Ser His
 165 170 175

Pro Val Gly Ser Gly Ser Gly Gly Leu Thr Pro Phe Ser Phe Pro Gln
 180 185 190

Val Thr Asn Ser Ser Val Thr Ser Ser Ser Phe Ile Phe Ser Lys Pro
 195 200 205

Val Thr Ser Asn Thr Pro Ala Phe Ala Ser Pro Leu Ser Asn Gln Asn
 210 215 220

Val Glu Glu Glu Lys Arg Val Ser Thr Ser Ala Phe Gly Ser Ser Asn
 225 230 235 240

Ser Ser Phe Ser Thr Phe Pro Thr Ala Ser Pro Gly Ser Leu Gly Glu
245 250 255

Pro Phe Pro Ala Asn Lys Pro Ser Leu Arg Gln Gly Cys Glu Glu Ala
260 265 270

Ile Ser Gln Val Glu Pro Leu Pro Thr Leu Met Lys Gly Leu Lys Arg
275 280 285

Lys Glu Asp Gln Asp Arg Ser Pro Arg Arg His Cys His Glu Ala Ala
290 295 300

Glu Asp Pro Asp Pro Leu Ser Arg Gly Asp His Pro Pro Asp Lys Arg
305 310 315 320

Pro Val Arg Leu Asn Arg Pro Arg Gly Gly Thr Leu Phe Gly Arg Thr
325 330 335

Ile Gln Glu Val Phe Lys Ser Asn Lys Glu Ala Gly Arg Leu Gly Ser
340 345 350

Lys Glu Ser Lys Glu Ser Gly Phe Ala Glu Pro Gly Glu Ser Asp His
355 360 365

Ala Ala Val Pro Gly Gly Ser Gln Ser Thr Met Val Pro Ser Arg Leu
370 375 380

Pro Ala Val Thr Lys Glu Glu Glu Glu Ser Arg Asp Glu Lys Glu Asp
385 390 395 400

Ser Leu Arg Gly Lys Ser Val Arg Gln Ser Lys Arg Arg Glu Glu Trp
405 410 415

Ile Tyr Ser Leu Gly Gly Val Ser Ser Leu Glu Leu Thr Ala Ile Gln
420 425 430

Cys Lys Asn Ile Pro Asp Tyr Leu Asn Asp Arg Ala Ile Leu Glu Lys
435 440 445

His Phe Ser Lys Ile Ala Lys Val Gln Arg Val Phe Thr Arg Arg Ser
450 455 460

Lys Lys Leu Ala Val Ile His Phe Phe Asp His Ala Ser Ala Ala Leu
 465 470 475 480

Ala Arg Lys Lys Gly Lys Gly Leu His Lys Asp Val Val Ile Phe Trp
 485 490 495

His Lys Lys Lys Ile Ser Pro Ser Lys Lys Leu Phe Pro Leu Lys Glu
 500 505 510

Lys Leu Gly Glu Ser Glu Ala Ser Gln Gly Ile Glu Asp Ser Pro Phe
 515 520 525

Gln His Ser Pro Leu Ser Lys Pro Ile Val Arg Pro Ala Ala Gly Ser
 530 535 540

Leu Leu Ser Lys Ser Ser Pro Val Lys Lys Pro Ser Leu Leu Lys Met
 545 550 555 560

His Gln Phe Glu Ala Asp Pro Phe Asp Ser Gly Ser Glu Gly Ser Glu
 565 570 575

Gly Leu Gly Ser Cys Val Ser Ser Leu Ser Thr Leu Ile Gly Thr Val
 580 585 590

Ala Asp Thr Ser Glu Glu Lys Tyr Arg Leu Leu Asp Gln Arg Asp Arg
 595 600 605

Ile Met Arg Gln Ala Arg Val Lys Arg Thr Asp Leu Asp Lys Ala Arg
 610 615 620

Ala Phe Val Gly Thr Cys Pro Asp Met Cys Pro Glu Lys Glu Arg Tyr
 625 630 635 640

Leu Arg Glu Thr Arg Ser Gln Leu Ser Val Phe Glu Val Val Pro Gly
 645 650 655

Thr Asp Gln Val Asp His Ala Ala Ala Val Lys Glu Tyr Ser Arg Ser
 660 665 670

Ser Ala Asp Gln Glu Glu Pro Leu Pro His Glu Leu Arg Pro Ser Ala
 675 680 685

Val Leu Ser Arg Thr Met Asp Tyr Leu Val Thr Gln Ile Met Asp Gln

690		695		700											
Lys 705	Glu	Gly	Ser	Leu	Arg 710	Asp	Trp	Tyr	Asp	Phe 715	Val	Trp	Asn	Arg	Thr 720
Arg	Gly	Ile	Arg	Lys 725	Asp	Ile	Thr	Gln	Gln 730	His	Leu	Cys	Asp	Pro	Leu 735
Thr	Val	Ser	Leu 740	Ile	Glu	Lys	Cys	Thr	Arg	Phe	His	Ile	His 750	Cys	Ala
His	Phe	Met 755	Cys	Glu	Glu	Pro	Met 760	Ser	Ser	Phe	Asp	Ala	Lys	Ile	Asn
Asn 770	Glu	Asn	Met	Thr	Lys	Cys 775	Leu	Gln	Ser	Leu	Lys 780	Glu	Met	Tyr	Gln
Asp 785	Leu	Arg	Asn	Lys	Gly 790	Val	Phe	Cys	Ala	Ser 795	Glu	Ala	Glu	Phe	Gln 800
Gly	Tyr	Asn	Val	Leu 805	Leu	Asn	Leu	Asn	Lys 810	Gly	Asp	Ile	Leu	Arg	Glu 815
Val	Gln	Gln	Phe 820	His	Pro	Asp	Val	Arg	Asn 825	Ser	Pro	Glu	Val	Asn	Phe 830
Ala	Val	Gln 835	Ala	Phe	Ala	Ala	Leu 840	Asn	Ser	Asn	Asn	Phe	Val	Arg	Phe 845
Phe 850	Lys	Leu	Val	Gln	Ser	Ala 855	Ser	Tyr	Leu	Asn	Ala 860	Cys	Leu	Leu	His
Cys 865	Tyr	Phe	Asn	Gln	Ile 870	Arg	Lys	Asp	Ala	Leu 875	Arg	Ala	Leu	Asn	Val 880
Ala	Tyr	Thr	Val	Ser 885	Thr	Gln	Arg	Ser	Thr 890	Val	Phe	Pro	Leu	Asp	Gly 895
Val	Val	Arg	Met 900	Leu	Leu	Phe	Arg	Asp 905	Ser	Glu	Glu	Ala	Thr	Asn	Phe 910
Leu	Asn	Tyr 915	His	Gly	Leu	Thr	Val 920	Ala	Asp	Gly	Cys	Val 925	Glu	Leu	Asn

Arg Ser Ala Phe Leu Glu Pro Glu Gly Leu Cys Lys Ala Arg Lys Ser
 930 935 940

Val Phe Ile Gly Arg Lys Leu Thr Val Ser Val Gly Glu Val Val Asn
 945 950 955 960

Gly Gly Pro Leu Pro Pro Val Pro Arg His Thr Pro Val Cys Ser Phe
 965 970 975

Asn Ser Gln Asn Lys Tyr Val Gly Glu Ser Leu Ala Thr Glu Leu Pro
 980 985 990

Ile Ser Thr Gln Arg Ala Gly Gly Asp Pro Ala Gly Gly Gly Arg Gly
 995 1000 1005

Glu Asp Cys Glu Ala Glu Val Asp Leu Pro Thr Leu Ala Val Leu
 1010 1015 1020

Pro Gln Pro Pro Pro Ala Ser Ser Ala Thr Pro Ala Leu His Val
 1025 1030 1035

Gln Pro Leu Ala Pro Ala Ala Ala Pro Ser Leu Leu Gln Ala Ser
 1040 1045 1050

Thr Gln Pro Glu Val Leu Leu Pro Lys Pro Ala Pro Val Tyr Ser
 1055 1060 1065

Asp Ser Asp Leu Val Gln Val Val Asp Glu Leu Ile Gln Glu Ala
 1070 1075 1080

Leu Gln Val Asp Cys Glu Glu Val Ser Ser Ala Gly Ala Ala Tyr
 1085 1090 1095

Val Ala Ala Ala Leu Gly Val Ser Asn Ala Ala Val Glu Asp Leu
 1100 1105 1110

Ile Thr Ala Ala Thr Thr Gly Ile Leu Arg His Val Ala Ala Glu
 1115 1120 1125

Glu Val Ser Met Glu Arg Gln Arg Leu Glu Glu Glu Lys Gln Arg
 1130 1135 1140

Ala	Glu	Glu	Glu	Arg	Leu	Lys	Gln	Glu	Arg	Glu	Leu	Met	Leu	Thr
1145						1150					1155			
Gln	Leu	Ser	Glu	Gly	Leu	Ala	Ala	Glu	Leu	Thr	Glu	Leu	Thr	Val
1160						1165					1170			
Thr	Glu	Cys	Val	Trp	Glu	Thr	Cys	Ser	Gln	Glu	Leu	Gln	Ser	Ala
1175						1180					1185			
Val	Lys	Ile	Asp	Gln	Lys	Val	Arg	Val	Ala	Arg	Cys	Cys	Glu	Ala
1190						1195					1200			
Val	Cys	Ala	His	Leu	Val	Asp	Leu	Phe	Leu	Ala	Glu	Glu	Ile	Phe
1205						1210					1215			
Gln	Thr	Ala	Lys	Glu	Thr	Leu	Gln	Glu	Leu	Gln	Cys	Phe	Cys	Lys
1220						1225					1230			
Tyr	Leu	Gln	Arg	Trp	Arg	Glu	Ala	Val	Ala	Ala	Arg	Lys	Lys	Phe
1235						1240					1245			
Arg	Arg	Gln	Met	Arg	Ala	Phe	Pro	Ala	Ala	Pro	Cys	Cys	Val	Asp
1250						1255					1260			
Val	Asn	Asp	Arg	Leu	Gln	Ala	Leu	Val	Pro	Ser	Ala	Glu	Cys	Pro
1265						1270					1275			
Ile	Thr	Glu	Glu	Asn	Leu	Ala	Lys	Gly	Leu	Leu	Asp	Leu	Gly	His
1280						1285					1290			
Ala	Gly	Lys	Val	Gly	Val	Ser	Cys	Thr	Arg	Leu	Arg	Arg	Leu	Arg
1295						1300					1305			
Asn	Lys	Thr	Ala	His	Gln	Ile	Lys	Val	Gln	His	Phe	His	Gln	Gln
1310						1315					1320			
Leu	Leu	Arg	Asn	Ala	Ala	Trp	Ala	Pro	Leu	Asp	Leu	Pro	Ser	Ile
1325						1330					1335			
Val	Ser	Glu	His	Leu	Pro	Met	Lys	Gln	Lys	Arg	Arg	Phe	Trp	Lys
1340						1345					1350			

Leu Val Leu Val Leu Pro Asp Val Glu Glu Gln Thr Pro Glu Ser
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Pro Gly Arg Ile Leu Glu Asn Trp Leu Lys Val Lys Phe Thr Gly
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Asp Asp Ser Met Val Gly Asp Ile Gly Asp Asn Ala Gly Asp Ile
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Gln Thr Leu Ser Val Phe Asn Thr Leu Ser Ser Lys Gly Asp Gln
 1400 1405 1410

Thr Val Ser Val Asn Val Cys Ile Lys Val Ala His Gly Thr Leu
 1415 1420 1425

Ser Asp Ser Ala Leu Asp Ala Val Glu Thr Gln Lys Asp Leu Leu
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Gly Thr Ser Gly Leu Met Leu Leu Leu Pro Pro Lys Val Lys Ser
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Glu Glu Val Ala Glu Glu Glu Leu Ser Trp Leu Ser Ala Leu Leu
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Gln Leu Lys Gln Leu Leu Gln Ala Lys Pro Phe Gln Pro Ala Leu
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Pro Leu Val Val Leu Val Pro Ser Ser Arg Gly Asp Ser Ala Gly
 1490 1495 1500

Arg Ala Val Glu Asp Gly Leu Met Leu Gln Asp Leu Val Ser Ala
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Lys Leu Ile Ser Asp Tyr Ile Val Val Glu Ile Pro Asp Ser Val
 1520 1525 1530

Asn Asp Leu Gln Gly Thr Val Lys Val Ser Gly Ala Val Gln Trp
 1535 1540 1545

Leu Ile Ser Gly Cys Pro Gln Ala Leu Asp Leu Cys Cys Gln Thr
 1550 1555 1560

Leu Val Gln Tyr Val Glu Asp Gly Ile Ser Arg Glu Phe Ser Arg

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Arg Phe Phe His Asp Arg Arg Glu Arg Arg Leu Ala Ser Leu Pro	1580	1585		1590
Ser Gln Glu Pro Ser Thr Ile Ile Glu Leu Phe Asn Ser Val Leu	1595	1600		1605
Gln Phe Leu Ala Ser Val Val Ser Ser Glu Gln Leu Cys Asp Ile	1610	1615		1620
Ser Trp Pro Val Met Glu Phe Ala Glu Val Gly Gly Ser Gln Leu	1625	1630		1635
Leu Pro His Leu His Trp Asn Ser Pro Glu His Leu Ala Trp Leu	1640	1645		1650
Lys Gln Ala Val Leu Gly Phe Gln Leu Pro Gln Met Asp Leu Pro	1655	1660		1665
Pro Pro Gly Ala Pro Trp Leu Pro Val Cys Ser Met Val Ile Gln	1670	1675		1680
Tyr Thr Ser Gln Ile Pro Ser Ser Ser Gln Thr Gln Pro Val Leu	1685	1690		1695
Gln Ser Gln Ala Glu Asn Leu Leu Cys Arg Thr Tyr Gln Lys Trp	1700	1705		1710
Lys Asn Lys Ser Leu Ser Pro Gly Gln Glu Leu Gly Pro Ser Val	1715	1720		1725
Ala Glu Ile Pro Trp Asp Asp Ile Ile Thr Leu Cys Ile Asn His	1730	1735		1740
Lys Leu Arg Asp Trp Thr Pro Pro Arg Leu Pro Val Thr Leu Glu	1745	1750		1755
Ala Leu Ser Glu Asp Gly Gln Ile Cys Val Tyr Phe Phe Lys Asn	1760	1765		1770
Leu Leu Arg Lys Tyr His Val Pro Ser Ser Trp Glu Gln Ala Arg	1775	1780		1785

Met Gln Thr Gln Arg Glu Leu Gln Leu Ser His Gly Arg Ser Gly
1790 1795 1800

Met Arg Ser Ile His Pro Pro Thr Ser Thr Phe Pro Thr Pro Leu
1805 1810 1815

Leu His Val His Gln Lys Gly Lys Lys Lys Glu Glu Ser Gly Arg
1820 1825 1830

Glu Gly Ser Leu Ser Thr Glu Asp Leu Leu Arg Gly Ala Ser Ala
1835 1840 1845

Glu Glu Leu Leu Ala Gln Ser Leu Ser Ser Ser Leu Leu Glu Glu
1850 1855 1860

Lys Glu Glu Asn Lys Arg Phe Glu Asp Gln Leu Gln Gln Trp Leu
1865 1870 1875

Ser Gln Asp Ser Gln Ala Phe Thr Glu Ser Thr Arg Leu Pro Leu
1880 1885 1890

Tyr Leu Pro Gln Thr Leu Val Ser Phe Pro Asp Ser Ile Lys Thr
1895 1900 1905

Gln Thr Met Val Lys Thr Ser Thr Ser Pro Gln Asn Ser Gly Thr
1910 1915 1920

Gly Lys Gln Leu Arg Phe Ser Glu Ala Ser Gly Ser Ser Leu Thr
1925 1930 1935

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1955 1960 1965

Val Asp Met
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Phe Ser Gly Gln Gln Pro Ser Ala Phe Ser Ala Ser Ser Ser Asn Val	
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Gly Thr Leu Pro Ser Lys Pro Pro Phe Arg Phe Gly Gln Pro Ser Leu	
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Phe Gly Gln Asn Ser Thr Leu Ser Gly Lys Ser Ser Gly Phe Ser Gln	
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Gln Thr Leu Gly Phe Thr Gln Thr Ser Ser Val Gly Pro Phe Ser Gly	
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Leu Glu His Thr Ser Thr Phe Val Ala Thr Ser Gly Pro Ser Ser Ser	
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Ser Val Leu Gly Asn Thr Gly Phe Ser Phe Lys Ser Pro Thr Ser Val	
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Val Asn Ser Gly Phe Gly Lys Thr Glu Phe Ser Phe Lys Pro Leu Glu	
135 140 145 150	
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Asn Ala Val Phe Lys Pro Ile Leu Gly Ala Glu Ser Glu Pro Glu Lys	
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Thr Gln Ser Gln Ile Ala Ser Gly Phe Phe Thr Phe Ser His Pro Ile	
170 175 180	
agt agt gca cct gga ggc ctg gcc cct ttc tct ttt cct caa gta aca	631

Ser	Ser	Ala	Pro	Gly	Gly	Leu	Ala	Pro	Phe	Ser	Phe	Pro	Gln	Val	Thr	
		185					190					195				
agt	agt	tca	gct	acc	act	tca	aat	ttt	acc	ttt	tca	aaa	cct	gtt	agt	679
Ser	Ser	Ser	Ala	Thr	Thr	Ser	Asn	Phe	Thr	Phe	Ser	Lys	Pro	Val	Ser	
		200					205				210					
agt	aat	aat	tca	tta	tct	gcc	ttt	acc	cct	gct	ttg	tca	aac	caa	aat	727
Ser	Asn	Asn	Ser	Leu	Ser	Ala	Phe	Thr	Pro	Ala	Leu	Ser	Asn	Gln	Asn	
215					220					225					230	
gta	gag	gaa	gag	aag	aga	gga	cct	aag	tca	ata	ttt	gga	agt	tct	aat	775
Val	Glu	Glu	Glu	Lys	Arg	Gly	Pro	Lys	Ser	Ile	Phe	Gly	Ser	Ser	Asn	
				235					240					245		
aat	agc	ttc	agt	agc	ttc	cct	gta	tca	tct	gcg	gtt	ttg	ggc	gaa	cct	823
Asn	Ser	Phe	Ser	Ser	Phe	Pro	Val	Ser	Ser	Ala	Val	Leu	Gly	Glu	Pro	
			250					255					260			
ttc	cag	gct	agc	aaa	gca	ggc	gtc	agg	cag	ggg	tgt	gaa	gaa	gct	gtt	871
Phe	Gln	Ala	Ser	Lys	Ala	Gly	Val	Arg	Gln	Gly	Cys	Glu	Glu	Ala	Val	
		265					270					275				
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Ser	Gln	Val	Glu	Pro	Leu	Pro	Ser	Leu	Met	Lys	Gly	Leu	Lys	Arg	Lys	
		280				285					290					
gag	gac	cag	gat	cgc	tcc	cca	agg	aga	cat	ggc	cac	gag	cca	gca	gaa	967
Glu	Asp	Gln	Asp	Arg	Ser	Pro	Arg	Arg	His	Gly	His	Glu	Pro	Ala	Glu	
295					300					305					310	
gat	tcg	gat	cct	ctg	tcc	cgg	ggc	gat	cat	cct	cca	gac	aaa	cga	cct	1015
Asp	Ser	Asp	Pro	Leu	Ser	Arg	Gly	Asp	His	Pro	Pro	Asp	Lys	Arg	Pro	
				315					320					325		
gtc	cgc	ctg	aat	cga	ccc	cgg	gga	ggc	act	tta	ttt	ggc	cgg	acg	ata	1063
Val	Arg	Leu	Asn	Arg	Pro	Arg	Gly	Gly	Thr	Leu	Phe	Gly	Arg	Thr	Ile	
			330					335					340			
cag	gat	gtt	ttc	aaa	agc	aat	aag	gaa	gta	ggc	cgt	ctg	ggc	aac	aag	1111
Gln	Asp	Val	Phe	Lys	Ser	Asn	Lys	Glu	Val	Gly	Arg	Leu	Gly	Asn	Lys	
		345					350					355				
gag	gcc	aaa	aag	gaa	act	ggc	ttt	gtt	gag	tct	gca	gaa	agt	gac	cac	1159
Glu	Ala	Lys	Lys	Glu	Thr	Gly	Phe	Val	Glu	Ser	Ala	Glu	Ser	Asp	His	
	360					365					370					
atg	gct	atc	cca	gga	ggg	aat	cag	tct	gtc	ctg	gca	cct	tcc	cgg	att	1207
Met	Ala	Ile	Pro	Gly	Gly	Asn	Gln	Ser	Val	Leu	Ala	Pro	Ser	Arg	Ile	
375					380					385					390	
cca	ggc	gtg	aat	aaa	gag	gaa	gaa	act	gaa	agt	aga	gag	aag	aaa	gaa	1255
Pro	Gly	Val	Asn	Lys	Glu	Glu	Glu	Thr	Glu	Ser	Arg	Glu	Lys	Lys	Glu	
				395					400					405		
gat	tct	cta	aga	gga	act	ccg	gcg	cgt	cag	agt	aac	aga	agc	gag	agc	1303
Asp	Ser	Leu	Arg	Gly	Thr	Pro	Ala	Arg	Gln	Ser	Asn	Arg	Ser	Glu	Ser	

410								415				420				
aca	gac	agt	ctt	ggg	ggc	ttg	tct	ccc	tct	gaa	gtc	aca	gcc	atc	cag	1351
Thr	Asp	Ser	Leu	Gly	Gly	Leu	Ser	Pro	Ser	Glu	Val	Thr	Ala	Ile	Gln	
		425					430					435				
tgc	aag	aac	atc	cct	gac	tac	ctc	aac	gac	agg	acc	att	ctg	gag	aac	1399
Cys	Lys	Asn	Ile	Pro	Asp	Tyr	Leu	Asn	Asp	Arg	Thr	Ile	Leu	Glu	Asn	
	440					445				450						
cat	ttt	ggc	aaa	att	gct	aaa	gtg	cag	cgc	atc	ttt	acc	agg	cgc	agc	1447
His	Phe	Gly	Lys	Ile	Ala	Lys	Val	Gln	Arg	Ile	Phe	Thr	Arg	Arg	Ser	
455					460				465						470	
aaa	aag	ctt	gca	gtg	gta	cat	ttc	ttt	gat	cat	gca	tct	gca	gcc	ctg	1495
Lys	Lys	Leu	Ala	Val	Val	His	Phe	Phe	Asp	His	Ala	Ser	Ala	Ala	Leu	
				475					480					485		
gct	aga	aag	aag	ggg	aaa	agt	ttg	cat	aaa	gac	atg	gct	atc	ttt	tgg	1543
Ala	Arg	Lys	Lys	Gly	Lys	Ser	Leu	His	Lys	Asp	Met	Ala	Ile	Phe	Trp	
			490					495					500			
cac	agg	aag	aaa	ata	agc	ccc	aat	aag	aaa	ccc	ttt	tcc	ctg	aag	gag	1591
His	Arg	Lys	Lys	Ile	Ser	Pro	Asn	Lys	Lys	Pro	Phe	Ser	Leu	Lys	Glu	
		505					510					515				
aag	aaa	cca	ggt	gac	ggt	gaa	gtc	agc	ccg	agc	aca	gag	gat	gca	ccc	1639
Lys	Lys	Pro	Gly	Asp	Gly	Glu	Val	Ser	Pro	Ser	Thr	Glu	Asp	Ala	Pro	
	520					525					530					
ttt	cag	cac	tct	cct	ctt	ggc	aag	gcc	gca	ggg	agg	act	ggt	gct	agc	1687
Phe	Gln	His	Ser	Pro	Leu	Gly	Lys	Ala	Ala	Gly	Arg	Thr	Gly	Ala	Ser	
535					540					545					550	
agc	ctc	ctg	aat	aaa	agc	tct	cca	gtg	aag	aag	cca	agt	ctt	cta	aag	1735
Ser	Leu	Leu	Asn	Lys	Ser	Ser	Pro	Val	Lys	Lys	Pro	Ser	Leu	Leu	Lys	
				555					560					565		
gcc	cac	caa	ttc	gag	gga	gac	tct	ttt	gac	tca	gcc	tcc	gag	ggc	tcc	1783
Ala	His	Gln	Phe	Glu	Gly	Asp	Ser	Phe	Asp	Ser	Ala	Ser	Glu	Gly	Ser	
			570					575					580			
gag	ggc	ctc	ggg	cca	tgt	gtg	ctc	tcc	ctc	agt	acc	ctg	ata	ggc	act	1831
Glu	Gly	Leu	Gly	Pro	Cys	Val	Leu	Ser	Leu	Ser	Thr	Leu	Ile	Gly	Thr	
		585					590					595				
gtg	gct	gag	aca	tcc	aag	gag	aag	tac	cgc	ctg	ctt	gac	cag	aga	gac	1879
Val	Ala	Glu	Thr	Ser	Lys	Glu	Lys	Tyr	Arg	Leu	Leu	Asp	Gln	Arg	Asp	
	600					605					610					
agg	atc	atg	cgg	caa	gct	cgg	gtg	aag	aga	acc	gat	ctg	gac	aaa	gcg	1927
Arg	Ile	Met	Arg	Gln	Ala	Arg	Val	Lys	Arg	Thr	Asp	Leu	Asp	Lys	Ala	
615					620					625					630	
agg	act	ttt	gtt	ggc	acc	tgc	ctg	gat	atg	tgt	cct	gag	aag	gag	agg	1975
Arg	Thr	Phe	Val	Gly	Thr	Cys	Leu	Asp	Met	Cys	Pro	Glu	Lys	Glu	Arg	
				635					640					645		

tac atg cgg gag acc cgt agc cag ctg agc gtg ttc gaa gtg gtc cca Tyr Met Arg Glu Thr Arg Ser Gln Leu Ser Val Phe Glu Val Val Pro 650 655 660	2023
ggg act gac cag gtg gac cac gca gca gct gtg aaa gag tac agt cgg Gly Thr Asp Gln Val Asp His Ala Ala Val Lys Glu Tyr Ser Arg 665 670 675	2071
tcc tcg gcg gat cag gag gag ccc ctg ccc cac gag ctg cgg ccc ttg Ser Ser Ala Asp Gln Glu Glu Pro Leu Pro His Glu Leu Arg Pro Leu 680 685 690	2119
cca gtg ctc agc agg acc atg gac tac ctg gtg acc cag atc atg gac Pro Val Leu Ser Arg Thr Met Asp Tyr Leu Val Thr Gln Ile Met Asp 695 700 705 710	2167
cag aag gag ggc agc ctg cgg gat tgg tat gac ttc gtg tgg aac cgc Gln Lys Glu Gly Ser Leu Arg Asp Trp Tyr Asp Phe Val Trp Asn Arg 715 720 725	2215
acg cgt ggc ata cgg aag gat atc acg cag cag cac ctc tgt gac ccc Thr Arg Gly Ile Arg Lys Asp Ile Thr Gln Gln His Leu Cys Asp Pro 730 735 740	2263
ctg acg gtg tcc ctg att gag aag tgc acc cgg ttt cac atc cac tgt Leu Thr Val Ser Leu Ile Glu Lys Cys Thr Arg Phe His Ile His Cys 745 750 755	2311
gcc cac ttc atg tgt gag gag ccc atg tcc tcc ttt gat gcc aag atc Ala His Phe Met Cys Glu Glu Pro Met Ser Ser Phe Asp Ala Lys Ile 760 765 770	2359
aat aat gag aac atg acc aag tgc ctg cag agc ctg aag gag atg tac Asn Asn Glu Asn Met Thr Lys Cys Leu Gln Ser Leu Lys Glu Met Tyr 775 780 785 790	2407
cag gac ctg aga aac aag ggt gtc ttc tgt gcc agc gaa gcg gag ttc Gln Asp Leu Arg Asn Lys Gly Val Phe Cys Ala Ser Glu Ala Glu Phe 795 800 805	2455
cag ggc tac aat gtt ctg ctc agt ctc aac aag gga gac atc cta aga Gln Gly Tyr Asn Val Leu Leu Ser Leu Asn Lys Gly Asp Ile Leu Arg 810 815 820	2503
gaa gta caa cag ttc cat cct gct gtt aga aac tca tct gag gtg aaa Glu Val Gln Gln Phe His Pro Ala Val Arg Asn Ser Ser Glu Val Lys 825 830 835	2551
ttt gct gtt cag gct ttt gct gca ttg aac agt aat aat ttt gtg aga Phe Ala Val Gln Ala Phe Ala Ala Leu Asn Ser Asn Asn Phe Val Arg 840 845 850	2599
ttt ttc aaa ctg gtc cag tca gct tct tac ctg aac gct tgt ctt tta Phe Phe Lys Leu Val Gln Ser Ala Ser Tyr Leu Asn Ala Cys Leu Leu 855 860 865 870	2647

cac tgt tac ttc agt cag atc cgc aag gat gct ctc cgg gcg ctc aac	2695
His Cys Tyr Phe Ser Gln Ile Arg Lys Asp Ala Leu Arg Ala Leu Asn	
875 880 885	
ttt gcg tac acg gtg agc aca cag cga tct acc atc ttt ccc ctg gat	2743
Phe Ala Tyr Thr Val Ser Thr Gln Arg Ser Thr Ile Phe Pro Leu Asp	
890 895 900	
ggc gtg gtg cgc atg ctg ctg ttc aga gac tgt gaa gag gcc acc gac	2791
Gly Val Val Arg Met Leu Leu Phe Arg Asp Cys Glu Glu Ala Thr Asp	
905 910 915	
ttc ctc acc tgc cac ggc ctc acc gtt tcc gac ggc tgt gtg gag ctg	2839
Phe Leu Thr Cys His Gly Leu Thr Val Ser Asp Gly Cys Val Glu Leu	
920 925 930	
aac cgg tct gca ttc ctg gaa cca gag gga tta tcc aag acc agg aag	2887
Asn Arg Ser Ala Phe Leu Glu Pro Glu Gly Leu Ser Lys Thr Arg Lys	
935 940 945 950	
tcg gtg ttt att act agg aag ctg acg gtg tca gtc ggg gaa att gtg	2935
Ser Val Phe Ile Thr Arg Lys Leu Thr Val Ser Val Gly Glu Ile Val	
955 960 965	
aac gga ggg cca ttg ccc ccc gtc cct cgt cac acc cct gtg tgc agc	2983
Asn Gly Gly Pro Leu Pro Pro Val Pro Arg His Thr Pro Val Cys Ser	
970 975 980	
ttc aac tcc cag aac aag tac atc ggg gag agc ctg gcc gcg gag ctg	3031
Phe Asn Ser Gln Asn Lys Tyr Ile Gly Glu Ser Leu Ala Ala Glu Leu	
985 990 995	
ccc gtc agc acc cag aga ccc ggc tcc gac aca gtg ggc gga ggg	3076
Pro Val Ser Thr Gln Arg Pro Gly Ser Asp Thr Val Gly Gly Gly	
1000 1005 1010	
aga gga gag gag tgt ggt gta gag ccg gat gca ccc ctg tcc agt	3121
Arg Gly Glu Glu Cys Gly Val Glu Pro Asp Ala Pro Leu Ser Ser	
1015 1020 1025	
ctc cca cag tct cta cca gcc cct gcg ccc tca cca gtg cct ctg	3166
Leu Pro Gln Ser Leu Pro Ala Pro Ala Pro Ser Pro Val Pro Leu	
1030 1035 1040	
cct cct gtc ctg gca ctg acc ccg tct gtg gcg ccc agc ctc ttc	3211
Pro Pro Val Leu Ala Leu Thr Pro Ser Val Ala Pro Ser Leu Phe	
1045 1050 1055	
cag ctg tct gtg cag cct gaa cca ccg cct cca gag ccc gtg ccc	3256
Gln Leu Ser Val Gln Pro Glu Pro Pro Pro Pro Glu Pro Val Pro	
1060 1065 1070	
atg tac tct gac gag gac ctg gcg cag gtg gtg gac gag ctc atc	3301
Met Tyr Ser Asp Glu Asp Leu Ala Gln Val Val Asp Glu Leu Ile	
1075 1080 1085	
cag gag gcc ctg cag agg gac tgt gag gaa gtt ggc tct gcg ggt	3346

Gln	Glu	Ala	Leu	Gln	Arg	Asp	Cys	Glu	Glu	Val	Gly	Ser	Ala	Gly	
	1090					1095					1100				
gct	gcc	tac	gca	gct	gcc	gcc	ctg	ggt	ggt	tct	aat	gct	gct	atg	3391
Ala	Ala	Tyr	Ala	Ala	Ala	Ala	Leu	Gly	Val	Ser	Asn	Ala	Ala	Met	
	1105					1110					1115				
gag	gat	ttg	tta	aca	gct	gca	acc	acg	ggc	att	ttg	agg	cac	att	3436
Glu	Asp	Leu	Leu	Thr	Ala	Ala	Thr	Thr	Gly	Ile	Leu	Arg	His	Ile	
	1120					1125					1130				
gca	gct	gaa	gaa	gtg	tct	aag	gaa	aga	gag	cga	agg	gag	cag	gag	3481
Ala	Ala	Glu	Glu	Val	Ser	Lys	Glu	Arg	Glu	Arg	Arg	Glu	Gln	Glu	
	1135					1140					1145				
agg	cag	cgg	gct	gaa	gag	gaa	agg	ttg	aaa	caa	gag	aga	gag	ctg	3526
Arg	Gln	Arg	Ala	Glu	Glu	Glu	Arg	Leu	Lys	Gln	Glu	Arg	Glu	Leu	
	1150					1155					1160				
gtg	tta	agt	gag	ctg	agc	cag	ggc	ctg	gcc	gtg	gag	ctg	atg	gaa	3571
Val	Leu	Ser	Glu	Leu	Ser	Gln	Gly	Leu	Ala	Val	Glu	Leu	Met	Glu	
	1165					1170					1175				
cgc	gtg	atg	atg	gag	ttt	gtg	agg	gaa	acc	tgc	tcc	cag	gag	ttg	3616
Arg	Val	Met	Met	Glu	Phe	Val	Arg	Glu	Thr	Cys	Ser	Gln	Glu	Leu	
	1180					1185					1190				
aag	aat	gca	gta	gag	aca	gac	cag	agg	gtc	cgt	gtg	gcc	cgt	tgc	3661
Lys	Asn	Ala	Val	Glu	Thr	Asp	Gln	Arg	Val	Arg	Val	Ala	Arg	Cys	
	1195					1200					1205				
tgt	gag	gat	gtc	tgt	gcc	cac	tta	gtg	gac	ttg	ttt	ctc	gtg	gag	3706
Cys	Glu	Asp	Val	Cys	Ala	His	Leu	Val	Asp	Leu	Phe	Leu	Val	Glu	
	1210					1215					1220				
gaa	atc	ttc	cag	act	gca	aag	gag	acc	ctc	cag	gag	ctt	cag	tgc	3751
Glu	Ile	Phe	Gln	Thr	Ala	Lys	Glu	Thr	Leu	Gln	Glu	Leu	Gln	Cys	
	1225					1230					1235				
ttc	tgc	aag	tat	cta	cag	cgg	tgg	agg	gaa	gct	gtc	aca	gcc	cgc	3796
Phe	Cys	Lys	Tyr	Leu	Gln	Arg	Trp	Arg	Glu	Ala	Val	Thr	Ala	Arg	
	1240					1245					1250				
aag	aaa	ctg	agg	cgc	caa	atg	cgg	gct	ttc	cct	gct	gcg	ccc	tgc	3841
Lys	Lys	Leu	Arg	Arg	Gln	Met	Arg	Ala	Phe	Pro	Ala	Ala	Pro	Cys	
	1255					1260					1265				
tgc	gtg	gac	gtg	agc	gac	cgg	ctg	agg	gcg	ctg	gcg	ccc	agc	gca	3886
Cys	Val	Asp	Val	Ser	Asp	Arg	Leu	Arg	Ala	Leu	Ala	Pro	Ser	Ala	
	1270					1275					1280				
gag	tgc	ccc	att	gct	gaa	gag	aac	ctg	gcc	agg	ggc	ctc	ctg	gac	3931
Glu	Cys	Pro	Ile	Ala	Glu	Glu	Asn	Leu	Ala	Arg	Gly	Leu	Leu	Asp	
	1285					1290					1295				
ctg	ggc	cat	gca	ggg	aga	ttg	ggc	atc	tct	tgc	acc	agg	tta	agg	3976
Leu	Gly	His	Ala	Gly	Arg	Leu	Gly	Ile	Ser	Cys	Thr	Arg	Leu	Arg	

1300	1305	1310	
cgg ctc aga aac aag aca gct cac cag atg aag gtt cag cac ttc			4021
Arg Leu Arg Asn Lys Thr Ala His Gln Met Lys Val Gln His Phe			
1315	1320	1325	
tac cag cag ctg ctg agt gat gtg gca tgg gcg tct ctg gac ctg			4066
Tyr Gln Gln Leu Leu Ser Asp Val Ala Trp Ala Ser Leu Asp Leu			
1330	1335	1340	
cca tcc ctc gtg gct gag cac ctc cct ggg agg cag gag cat gtg			4111
Pro Ser Leu Val Ala Glu His Leu Pro Gly Arg Gln Glu His Val			
1345	1350	1355	
ttt tgg aag ctg gtg ctg gtg ttg ccg gat gta gag gag cag tcc			4156
Phe Trp Lys Leu Val Leu Val Leu Pro Asp Val Glu Glu Gln Ser			
1360	1365	1370	
cca gag agt tgt ggc aga att cta gca aat tgg tta aaa gtc aag			4201
Pro Glu Ser Cys Gly Arg Ile Leu Ala Asn Trp Leu Lys Val Lys			
1375	1380	1385	
ttc atg gga gat gaa ggc tca gtg gat gac aca tcc agc gat gct			4246
Phe Met Gly Asp Glu Gly Ser Val Asp Asp Thr Ser Ser Asp Ala			
1390	1395	1400	
ggt ggg att cag acg ctt tcg ctt ttc aac tca ctt agc agc aaa			4291
Gly Gly Ile Gln Thr Leu Ser Leu Phe Asn Ser Leu Ser Ser Lys			
1405	1410	1415	
ggg gat cag atg att tct gtt aac gtg tgt ata aag gtg gcc cat			4336
Gly Asp Gln Met Ile Ser Val Asn Val Cys Ile Lys Val Ala His			
1420	1425	1430	
ggc gcc ctc agt gat ggt gcc att gat gct gtg gag aca cag aag			4381
Gly Ala Leu Ser Asp Gly Ala Ile Asp Ala Val Glu Thr Gln Lys			
1435	1440	1445	
gac ctc ctg gga gcc agt ggg ctc atg ctg ctg ctt ccc ccc aaa			4426
Asp Leu Leu Gly Ala Ser Gly Leu Met Leu Leu Leu Pro Pro Lys			
1450	1455	1460	
atg aag agt gag gac atg gca gag gag gac gtg tac tgg ctg tcg			4471
Met Lys Ser Glu Asp Met Ala Glu Glu Asp Val Tyr Trp Leu Ser			
1465	1470	1475	
gcc ttg ctg cag ctc aag cag ctc ctg cag gct aag ccc ttc cag			4516
Ala Leu Leu Gln Leu Lys Gln Leu Leu Gln Ala Lys Pro Phe Gln			
1480	1485	1490	
cct gcg ctt cct ctg gtg gtt ctt gtg cct agc cca gga ggg gac			4561
Pro Ala Leu Pro Leu Val Val Leu Val Pro Ser Pro Gly Gly Asp			
1495	1500	1505	
gcc gtt gag aag gaa gta gaa gat ggt ctg atg cta cag gac ttg			4606
Ala Val Glu Lys Glu Val Glu Asp Gly Leu Met Leu Gln Asp Leu			
1510	1515	1520	

gtt tca gct aag ctg att tca gat tac act gtt acc gag atc cct Val Ser Ala Lys Leu Ile Ser Asp Tyr Thr Val Thr Glu Ile Pro 1525 1530 1535	4651
gat acc att aat gat cta caa ggt tca act aag gtt ttg caa gca Asp Thr Ile Asn Asp Leu Gln Gly Ser Thr Lys Val Leu Gln Ala 1540 1545 1550	4696
gtg cag tgg ctg gtt tcc cac tgc ccc cat tcc ctt gac ctc tgc Val Gln Trp Leu Val Ser His Cys Pro His Ser Leu Asp Leu Cys 1555 1560 1565	4741
tgc cag act ctc att cag tac gtc gaa gac ggg att ggc cat gag Cys Gln Thr Leu Ile Gln Tyr Val Glu Asp Gly Ile Gly His Glu 1570 1575 1580	4786
ttt agt ggc cgc ttt ttc cat gac aga aga gag agg cgt ctg ggc Phe Ser Gly Arg Phe Phe His Asp Arg Arg Glu Arg Arg Leu Gly 1585 1590 1595	4831
ggt ctt gct tct cag gag cct ggc gcc atc att gag ctg ttt aac Gly Leu Ala Ser Gln Glu Pro Gly Ala Ile Ile Glu Leu Phe Asn 1600 1605 1610	4876
agt gtg ctg cag ttc ctg gct tct gtg gtg tcc tct gaa cag ctg Ser Val Leu Gln Phe Leu Ala Ser Val Val Ser Ser Glu Gln Leu 1615 1620 1625	4921
tgt gac ctg tcc tgg cct gtc act gag ttt gct gag gca ggg ggc Cys Asp Leu Ser Trp Pro Val Thr Glu Phe Ala Glu Ala Gly Gly 1630 1635 1640	4966
agc cgg ctg ctt cct cac ctg cac tgg aat gcc cca gag cac ctg Ser Arg Leu Leu Pro His Leu His Trp Asn Ala Pro Glu His Leu 1645 1650 1655	5011
gcc tgg ctg aag cag gct gtg ctc ggg ttc cag ctt ccg cag atg Ala Trp Leu Lys Gln Ala Val Leu Gly Phe Gln Leu Pro Gln Met 1660 1665 1670	5056
gac ctt cca ccc ctg ggg gcc ccc tgg ctc ccc gtg tgc tcc atg Asp Leu Pro Pro Leu Gly Ala Pro Trp Leu Pro Val Cys Ser Met 1675 1680 1685	5101
gtt gtc cag tac gcc tcc cag atc ccc agc tca cgc cag aca cag Val Val Gln Tyr Ala Ser Gln Ile Pro Ser Ser Arg Gln Thr Gln 1690 1695 1700	5146
cct gtc ctc cag tcc cag gtg gag aac ctg ctc cac aga acc tac Pro Val Leu Gln Ser Gln Val Glu Asn Leu Leu His Arg Thr Tyr 1705 1710 1715	5191
tgt agg tgg aag agc aag agt ccc tcc cca gtc cat ggg gca ggc Cys Arg Trp Lys Ser Lys Ser Pro Ser Pro Val His Gly Ala Gly 1720 1725 1730	5236

ccc	tcg	gtc	atg	gag	atc	cca	tgg	gat	gat	ctt	atc	gcc	ttg	tgt	5281
Pro	Ser	Val	Met	Glu	Ile	Pro	Trp	Asp	Asp	Leu	Ile	Ala	Leu	Cys	
1735						1740					1745				
atc	aac	cac	aag	ctg	aga	gac	tgg	acg	ccc	ccc	cgg	ctt	cct	gtt	5326
Ile	Asn	His	Lys	Leu	Arg	Asp	Trp	Thr	Pro	Pro	Arg	Leu	Pro	Val	
1750						1755					1760				
aca	tca	gag	gcg	ctg	agt	gaa	gat	ggt	cag	ata	tgt	gtg	tat	ttt	5371
Thr	Ser	Glu	Ala	Leu	Ser	Glu	Asp	Gly	Gln	Ile	Cys	Val	Tyr	Phe	
1765						1770					1775				
ttt	aaa	aac	gat	ttg	aaa	aaa	tat	gat	ggt	cct	ttg	tcg	tgg	gaa	5416
Phe	Lys	Asn	Asp	Leu	Lys	Lys	Tyr	Asp	Val	Pro	Leu	Ser	Trp	Glu	
1780						1785					1790				
caa	gcc	agg	ttg	cag	acg	cag	aag	gag	cta	cag	ctg	aga	gag	gga	5461
Gln	Ala	Arg	Leu	Gln	Thr	Gln	Lys	Glu	Leu	Gln	Leu	Arg	Glu	Gly	
1795						1800					1805				
cgt	ttg	gca	ata	aag	cct	ttt	cat	cct	tct	gca	aac	aat	ttt	ccc	5506
Arg	Leu	Ala	Ile	Lys	Pro	Phe	His	Pro	Ser	Ala	Asn	Asn	Phe	Pro	
1810						1815					1820				
ata	cca	ttg	ctt	cac	atg	cac	cgt	aac	tgg	aag	agg	agc	aca	gag	5551
Ile	Pro	Leu	Leu	His	Met	His	Arg	Asn	Trp	Lys	Arg	Ser	Thr	Glu	
1825						1830					1835				
tgt	gct	caa	gag	ggg	agg	att	ccc	agc	aca	gag	gat	ctg	atg	cga	5596
Cys	Ala	Gln	Glu	Gly	Arg	Ile	Pro	Ser	Thr	Glu	Asp	Leu	Met	Arg	
1840						1845					1850				
gga	gct	tct	gct	gag	gag	ctc	ttg	gcg	cag	tgt	ttg	tcg	agc	agt	5641
Gly	Ala	Ser	Ala	Glu	Glu	Leu	Leu	Ala	Gln	Cys	Leu	Ser	Ser	Ser	
1855						1860					1865				
ctg	ctg	ctg	gag	aaa	gaa	gag	aac	aag	agg	ttt	gaa	gat	cag	ctt	5686
Leu	Leu	Leu	Glu	Lys	Glu	Glu	Asn	Lys	Arg	Phe	Glu	Asp	Gln	Leu	
1870						1875					1880				
cag	caa	tgg	ttg	tct	gaa	gac	tca	gga	gca	ttt	acg	gat	tta	act	5731
Gln	Gln	Trp	Leu	Ser	Glu	Asp	Ser	Gly	Ala	Phe	Thr	Asp	Leu	Thr	
1885						1890					1895				
tcc	ctt	ccc	ctc	tat	ctt	cct	cag	act	cta	gtg	tct	ctt	tct	cac	5776
Ser	Leu	Pro	Leu	Tyr	Leu	Pro	Gln	Thr	Leu	Val	Ser	Leu	Ser	His	
1900						1905					1910				
act	att	gaa	cct	gtg	atg	aaa	aca	tct	gta	act	act	agc	cca	cag	5821
Thr	Ile	Glu	Pro	Val	Met	Lys	Thr	Ser	Val	Thr	Thr	Ser	Pro	Gln	
1915						1920					1925				
agt	gac	atg	atg	agg	gag	caa	ctg	cag	ctg	tca	gag	gcg	aca	gga	5866
Ser	Asp	Met	Met	Arg	Glu	Gln	Leu	Gln	Leu	Ser	Glu	Ala	Thr	Gly	
1930						1935					1940				
acg	tgt	cta	ggc	gaa	cga	cta	aag	cac	ctg	gaa	agg	ctg	atc	cgg	5911

Thr Cys Leu Gly Glu Arg Leu Lys His Leu Glu Arg Leu Ile Arg
 1945 1950 1955
 agt tca agg gaa gag gaa gtt gcc tct gag ctc cat ctc tct gcg 5956
 Ser Ser Arg Glu Glu Glu Val Ala Ser Glu Leu His Leu Ser Ala
 1960 1965 1970
 ctg cta gac atg gtg gac att tgagcagcct gacctgtggg gagggggtct 6007
 Leu Leu Asp Met Val Asp Ile
 1975 1980
 ctcccgaaga gtttctgttt ttactcaaaa taatgttatt ctcagatgct tgatgcactg 6067
 ttggaaatgt gattaattta atcatgcaga taaaccattt aaatgtc 6114

<210> 4
 <211> 1980
 <212> PRT
 <213> Homo sapiens

<400> 4

Met Asn Pro Thr Asn Pro Phe Ser Gly Gln Gln Pro Ser Ala Phe Ser
 1 5 10 15

Ala Ser Ser Ser Asn Val Gly Thr Leu Pro Ser Lys Pro Pro Phe Arg
 20 25 30

Phe Gly Gln Pro Ser Leu Phe Gly Gln Asn Ser Thr Leu Ser Gly Lys
 35 40 45

Ser Ser Gly Phe Ser Gln Val Ser Ser Phe Pro Ala Ser Ser Gly Val
 50 55 60

Ser His Ser Ser Ser Val Gln Thr Leu Gly Phe Thr Gln Thr Ser Ser
 65 70 75 80

Val Gly Pro Phe Ser Gly Leu Glu His Thr Ser Thr Phe Val Ala Thr
 85 90 95

Ser Gly Pro Ser Ser Ser Ser Val Leu Gly Asn Thr Gly Phe Ser Phe
 100 105 110

Lys Ser Pro Thr Ser Val Gly Ala Phe Pro Ser Thr Ser Ala Phe Gly
 115 120 125

Gln Glu Ala Gly Glu Ile Val Asn Ser Gly Phe Gly Lys Thr Glu Phe
 130 135 140

Ser Phe Lys Pro Leu Glu Asn Ala Val Phe Lys Pro Ile Leu Gly Ala
 145 150 155 160

Glu Ser Glu Pro Glu Lys Thr Gln Ser Gln Ile Ala Ser Gly Phe Phe
 165 170 175

Thr Phe Ser His Pro Ile Ser Ser Ala Pro Gly Gly Leu Ala Pro Phe
 180 185 190

Ser Phe Pro Gln Val Thr Ser Ser Ser Ala Thr Thr Ser Asn Phe Thr
 195 200 205

Phe Ser Lys Pro Val Ser Ser Asn Asn Ser Leu Ser Ala Phe Thr Pro
 210 215 220

Ala Leu Ser Asn Gln Asn Val Glu Glu Glu Lys Arg Gly Pro Lys Ser
 225 230 235 240

Ile Phe Gly Ser Ser Asn Asn Ser Phe Ser Ser Phe Pro Val Ser Ser
 245 250 255

Ala Val Leu Gly Glu Pro Phe Gln Ala Ser Lys Ala Gly Val Arg Gln
 260 265 270

Gly Cys Glu Glu Ala Val Ser Gln Val Glu Pro Leu Pro Ser Leu Met
 275 280 285

Lys Gly Leu Lys Arg Lys Glu Asp Gln Asp Arg Ser Pro Arg Arg His
 290 295 300

Gly His Glu Pro Ala Glu Asp Ser Asp Pro Leu Ser Arg Gly Asp His
 305 310 315 320

Pro Pro Asp Lys Arg Pro Val Arg Leu Asn Arg Pro Arg Gly Gly Thr
 325 330 335

Leu Phe Gly Arg Thr Ile Gln Asp Val Phe Lys Ser Asn Lys Glu Val
 340 345 350

Gly Arg Leu Gly Asn Lys Glu Ala Lys Lys Glu Thr Gly Phe Val Glu
 355 360 365

Ser Ala Glu Ser Asp His Met Ala Ile Pro Gly Gly Asn Gln Ser Val
370 375 380

Leu Ala Pro Ser Arg Ile Pro Gly Val Asn Lys Glu Glu Glu Thr Glu
385 390 395 400

Ser Arg Glu Lys Lys Glu Asp Ser Leu Arg Gly Thr Pro Ala Arg Gln
405 410 415

Ser Asn Arg Ser Glu Ser Thr Asp Ser Leu Gly Gly Leu Ser Pro Ser
420 425 430

Glu Val Thr Ala Ile Gln Cys Lys Asn Ile Pro Asp Tyr Leu Asn Asp
435 440 445

Arg Thr Ile Leu Glu Asn His Phe Gly Lys Ile Ala Lys Val Gln Arg
450 455 460

Ile Phe Thr Arg Arg Ser Lys Lys Leu Ala Val Val His Phe Phe Asp
465 470 475 480

His Ala Ser Ala Ala Leu Ala Arg Lys Lys Gly Lys Ser Leu His Lys
485 490 495

Asp Met Ala Ile Phe Trp His Arg Lys Lys Ile Ser Pro Asn Lys Lys
500 505 510

Pro Phe Ser Leu Lys Glu Lys Lys Pro Gly Asp Gly Glu Val Ser Pro
515 520 525

Ser Thr Glu Asp Ala Pro Phe Gln His Ser Pro Leu Gly Lys Ala Ala
530 535 540

Gly Arg Thr Gly Ala Ser Ser Leu Leu Asn Lys Ser Ser Pro Val Lys
545 550 555 560

Lys Pro Ser Leu Leu Lys Ala His Gln Phe Glu Gly Asp Ser Phe Asp
565 570 575

Ser Ala Ser Glu Gly Ser Glu Gly Leu Gly Pro Cys Val Leu Ser Leu
580 585 590

Ser Thr Leu Ile Gly Thr Val Ala Glu Thr Ser Lys Glu Lys Tyr Arg
595 600 605

Leu Leu Asp Gln Arg Asp Arg Ile Met Arg Gln Ala Arg Val Lys Arg
610 615 620

Thr Asp Leu Asp Lys Ala Arg Thr Phe Val Gly Thr Cys Leu Asp Met
625 630 635 640

Cys Pro Glu Lys Glu Arg Tyr Met Arg Glu Thr Arg Ser Gln Leu Ser
645 650 655

Val Phe Glu Val Val Pro Gly Thr Asp Gln Val Asp His Ala Ala Ala
660 665 670

Val Lys Glu Tyr Ser Arg Ser Ser Ala Asp Gln Glu Glu Pro Leu Pro
675 680 685

His Glu Leu Arg Pro Leu Pro Val Leu Ser Arg Thr Met Asp Tyr Leu
690 695 700

Val Thr Gln Ile Met Asp Gln Lys Glu Gly Ser Leu Arg Asp Trp Tyr
705 710 715 720

Asp Phe Val Trp Asn Arg Thr Arg Gly Ile Arg Lys Asp Ile Thr Gln
725 730 735

Gln His Leu Cys Asp Pro Leu Thr Val Ser Leu Ile Glu Lys Cys Thr
740 745 750

Arg Phe His Ile His Cys Ala His Phe Met Cys Glu Glu Pro Met Ser
755 760 765

Ser Phe Asp Ala Lys Ile Asn Asn Glu Asn Met Thr Lys Cys Leu Gln
770 775 780

Ser Leu Lys Glu Met Tyr Gln Asp Leu Arg Asn Lys Gly Val Phe Cys
785 790 795 800

Ala Ser Glu Ala Glu Phe Gln Gly Tyr Asn Val Leu Leu Ser Leu Asn
805 810 815

Lys Gly Asp Ile Leu Arg Glu Val Gln Gln Phe His Pro Ala Val Arg

820	825	830
Asn Ser Ser Glu Val Lys Phe Ala Val Gln Ala Phe Ala Ala Leu Asn		
835	840	845
Ser Asn Asn Phe Val Arg Phe Phe Lys Leu Val Gln Ser Ala Ser Tyr		
850	855	860
Leu Asn Ala Cys Leu Leu His Cys Tyr Phe Ser Gln Ile Arg Lys Asp		
865	870	875
Ala Leu Arg Ala Leu Asn Phe Ala Tyr Thr Val Ser Thr Gln Arg Ser		
885	890	895
Thr Ile Phe Pro Leu Asp Gly Val Val Arg Met Leu Leu Phe Arg Asp		
900	905	910
Cys Glu Glu Ala Thr Asp Phe Leu Thr Cys His Gly Leu Thr Val Ser		
915	920	925
Asp Gly Cys Val Glu Leu Asn Arg Ser Ala Phe Leu Glu Pro Glu Gly		
930	935	940
Leu Ser Lys Thr Arg Lys Ser Val Phe Ile Thr Arg Lys Leu Thr Val		
945	950	955
Ser Val Gly Glu Ile Val Asn Gly Gly Pro Leu Pro Pro Val Pro Arg		
965	970	975
His Thr Pro Val Cys Ser Phe Asn Ser Gln Asn Lys Tyr Ile Gly Glu		
980	985	990
Ser Leu Ala Ala Glu Leu Pro Val Ser Thr Gln Arg Pro Gly Ser Asp		
995	1000	1005
Thr Val Gly Gly Gly Arg Gly Glu Glu Cys Gly Val Glu Pro Asp		
1010	1015	1020
Ala Pro Leu Ser Ser Leu Pro Gln Ser Leu Pro Ala Pro Ala Pro		
1025	1030	1035
Ser Pro Val Pro Leu Pro Pro Val Leu Ala Leu Thr Pro Ser Val		
1040	1045	1050

Ala	Pro	Ser	Leu	Phe	Gln	Leu	Ser	Val	Gln	Pro	Glu	Pro	Pro	Pro
1055						1060					1065			
Pro	Glu	Pro	Val	Pro	Met	Tyr	Ser	Asp	Glu	Asp	Leu	Ala	Gln	Val
1070						1075					1080			
Val	Asp	Glu	Leu	Ile	Gln	Glu	Ala	Leu	Gln	Arg	Asp	Cys	Glu	Glu
1085						1090					1095			
Val	Gly	Ser	Ala	Gly	Ala	Ala	Tyr	Ala	Ala	Ala	Ala	Leu	Gly	Val
1100						1105					1110			
Ser	Asn	Ala	Ala	Met	Glu	Asp	Leu	Leu	Thr	Ala	Ala	Thr	Thr	Gly
1115						1120					1125			
Ile	Leu	Arg	His	Ile	Ala	Ala	Glu	Glu	Val	Ser	Lys	Glu	Arg	Glu
1130						1135					1140			
Arg	Arg	Glu	Gln	Glu	Arg	Gln	Arg	Ala	Glu	Glu	Glu	Arg	Leu	Lys
1145						1150					1155			
Gln	Glu	Arg	Glu	Leu	Val	Leu	Ser	Glu	Leu	Ser	Gln	Gly	Leu	Ala
1160						1165					1170			
Val	Glu	Leu	Met	Glu	Arg	Val	Met	Met	Glu	Phe	Val	Arg	Glu	Thr
1175						1180					1185			
Cys	Ser	Gln	Glu	Leu	Lys	Asn	Ala	Val	Glu	Thr	Asp	Gln	Arg	Val
1190						1195					1200			
Arg	Val	Ala	Arg	Cys	Cys	Glu	Asp	Val	Cys	Ala	His	Leu	Val	Asp
1205						1210					1215			
Leu	Phe	Leu	Val	Glu	Glu	Ile	Phe	Gln	Thr	Ala	Lys	Glu	Thr	Leu
1220						1225					1230			
Gln	Glu	Leu	Gln	Cys	Phe	Cys	Lys	Tyr	Leu	Gln	Arg	Trp	Arg	Glu
1235						1240					1245			
Ala	Val	Thr	Ala	Arg	Lys	Lys	Leu	Arg	Arg	Gln	Met	Arg	Ala	Phe
1250						1255					1260			

Pro Ala Ala Pro Cys Cys Val Asp Val Ser Asp Arg Leu Arg Ala
 1265 1270 1275

Leu Ala Pro Ser Ala Glu Cys Pro Ile Ala Glu Glu Asn Leu Ala
 1280 1285 1290

Arg Gly Leu Leu Asp Leu Gly His Ala Gly Arg Leu Gly Ile Ser
 1295 1300 1305

Cys Thr Arg Leu Arg Arg Leu Arg Asn Lys Thr Ala His Gln Met
 1310 1315 1320

Lys Val Gln His Phe Tyr Gln Gln Leu Leu Ser Asp Val Ala Trp
 1325 1330 1335

Ala Ser Leu Asp Leu Pro Ser Leu Val Ala Glu His Leu Pro Gly
 1340 1345 1350

Arg Gln Glu His Val Phe Trp Lys Leu Val Leu Val Leu Pro Asp
 1355 1360 1365

Val Glu Glu Gln Ser Pro Glu Ser Cys Gly Arg Ile Leu Ala Asn
 1370 1375 1380

Trp Leu Lys Val Lys Phe Met Gly Asp Glu Gly Ser Val Asp Asp
 1385 1390 1395

Thr Ser Ser Asp Ala Gly Gly Ile Gln Thr Leu Ser Leu Phe Asn
 1400 1405 1410

Ser Leu Ser Ser Lys Gly Asp Gln Met Ile Ser Val Asn Val Cys
 1415 1420 1425

Ile Lys Val Ala His Gly Ala Leu Ser Asp Gly Ala Ile Asp Ala
 1430 1435 1440

Val Glu Thr Gln Lys Asp Leu Leu Gly Ala Ser Gly Leu Met Leu
 1445 1450 1455

Leu Leu Pro Pro Lys Met Lys Ser Glu Asp Met Ala Glu Glu Asp
 1460 1465 1470

Val Tyr Trp Leu Ser Ala Leu Leu Gln Leu Lys Gln Leu Leu Gln
1475 1480 1485

Ala Lys Pro Phe Gln Pro Ala Leu Pro Leu Val Val Leu Val Pro
1490 1495 1500

Ser Pro Gly Gly Asp Ala Val Glu Lys Glu Val Glu Asp Gly Leu
1505 1510 1515

Met Leu Gln Asp Leu Val Ser Ala Lys Leu Ile Ser Asp Tyr Thr
1520 1525 1530

Val Thr Glu Ile Pro Asp Thr Ile Asn Asp Leu Gln Gly Ser Thr
1535 1540 1545

Lys Val Leu Gln Ala Val Gln Trp Leu Val Ser His Cys Pro His
1550 1555 1560

Ser Leu Asp Leu Cys Cys Gln Thr Leu Ile Gln Tyr Val Glu Asp
1565 1570 1575

Gly Ile Gly His Glu Phe Ser Gly Arg Phe Phe His Asp Arg Arg
1580 1585 1590

Glu Arg Arg Leu Gly Gly Leu Ala Ser Gln Glu Pro Gly Ala Ile
1595 1600 1605

Ile Glu Leu Phe Asn Ser Val Leu Gln Phe Leu Ala Ser Val Val
1610 1615 1620

Ser Ser Glu Gln Leu Cys Asp Leu Ser Trp Pro Val Thr Glu Phe
1625 1630 1635

Ala Glu Ala Gly Gly Ser Arg Leu Leu Pro His Leu His Trp Asn
1640 1645 1650

Ala Pro Glu His Leu Ala Trp Leu Lys Gln Ala Val Leu Gly Phe
1655 1660 1665

Gln Leu Pro Gln Met Asp Leu Pro Pro Leu Gly Ala Pro Trp Leu
1670 1675 1680

Pro Val Cys Ser Met Val Val Gln Tyr Ala Ser Gln Ile Pro Ser

1685		1690		1695
Ser Arg Gln Thr Gln Pro Val Leu Gln Ser Gln Val Glu Asn Leu				
1700		1705		1710
Leu His Arg Thr Tyr Cys Arg Trp Lys Ser Lys Ser Pro Ser Pro				
1715		1720		1725
Val His Gly Ala Gly Pro Ser Val Met Glu Ile Pro Trp Asp Asp				
1730		1735		1740
Leu Ile Ala Leu Cys Ile Asn His Lys Leu Arg Asp Trp Thr Pro				
1745		1750		1755
Pro Arg Leu Pro Val Thr Ser Glu Ala Leu Ser Glu Asp Gly Gln				
1760		1765		1770
Ile Cys Val Tyr Phe Phe Lys Asn Asp Leu Lys Lys Tyr Asp Val				
1775		1780		1785
Pro Leu Ser Trp Glu Gln Ala Arg Leu Gln Thr Gln Lys Glu Leu				
1790		1795		1800
Gln Leu Arg Glu Gly Arg Leu Ala Ile Lys Pro Phe His Pro Ser				
1805		1810		1815
Ala Asn Asn Phe Pro Ile Pro Leu Leu His Met His Arg Asn Trp				
1820		1825		1830
Lys Arg Ser Thr Glu Cys Ala Gln Glu Gly Arg Ile Pro Ser Thr				
1835		1840		1845
Glu Asp Leu Met Arg Gly Ala Ser Ala Glu Glu Leu Leu Ala Gln				
1850		1855		1860
Cys Leu Ser Ser Ser Leu Leu Leu Glu Lys Glu Glu Asn Lys Arg				
1865		1870		1875
Phe Glu Asp Gln Leu Gln Gln Trp Leu Ser Glu Asp Ser Gly Ala				
1880		1885		1890
Phe Thr Asp Leu Thr Ser Leu Pro Leu Tyr Leu Pro Gln Thr Leu				
1895		1900		1905

Val Ser Leu Ser His Thr Ile Glu Pro Val Met Lys Thr Ser Val
 1910 1915 1920

Thr Thr Ser Pro Gln Ser Asp Met Met Arg Glu Gln Leu Gln Leu
 1925 1930 1935

Ser Glu Ala Thr Gly Thr Cys Leu Gly Glu Arg Leu Lys His Leu
 1940 1945 1950

Glu Arg Leu Ile Arg Ser Ser Arg Glu Glu Glu Val Ala Ser Glu
 1955 1960 1965

Leu His Leu Ser Ala Leu Leu Asp Met Val Asp Ile
 1970 1975 1980

<210> 5
 <211> 863
 <212> PRT
 <213> retroviral provirus

<400> 5

Lys Glu Gln Lys Thr Val Ala Met Arg Val Lys Glu Lys Tyr Gln His
 1 5 10 15

Leu Trp Arg Trp Gly Trp Arg Trp Gly Thr Met Leu Leu Gly Met Leu
 20 25 30

Met Ile Cys Ser Ala Thr Glu Lys Leu Trp Val Thr Val Tyr Tyr Gly
 35 40 45

Val Pro Val Trp Lys Glu Ala Thr Thr Thr Leu Phe Cys Ala Ser Asp
 50 55 60

Ala Lys Ala Tyr Asp Thr Glu Val His Asn Val Trp Ala Thr His Ala
 65 70 75 80

Cys Val Pro Thr Asp Pro Asn Pro Gln Glu Val Val Leu Val Asn Val
 85 90 95

Thr Glu Asn Phe Asn Met Trp Lys Asn Asp Met Val Glu Gln Met His
 100 105 110

Glu Asp Ile Ile Ser Leu Trp Asp Gln Ser Leu Lys Pro Cys Val Lys
 115 120 125

Leu Thr Pro Leu Cys Val Ser Leu Lys Cys Thr Asp Leu Lys Asn Asp
 130 135 140

Thr Asn Thr Asn Ser Ser Ser Gly Arg Met Ile Met Glu Lys Gly Glu
 145 150 155 160

Ile Lys Asn Cys Ser Phe Asn Ile Ser Thr Ser Ile Arg Gly Lys Val
 165 170 175

Gln Lys Glu Tyr Ala Phe Phe Tyr Lys Leu Asp Ile Ile Pro Ile Asp
 180 185 190

Asn Asp Thr Thr Ser Tyr Thr Leu Thr Ser Cys Asn Thr Ser Val Ile
 195 200 205

Thr Gln Ala Cys Pro Lys Val Ser Phe Glu Pro Ile Pro Ile His Tyr
 210 215 220

Cys Ala Pro Ala Gly Phe Ala Ile Leu Lys Cys Asn Asn Lys Thr Phe
 225 230 235 240

Asn Gly Thr Gly Pro Cys Thr Asn Val Ser Thr Val Gln Cys Thr His
 245 250 255

Gly Ile Arg Pro Val Val Ser Thr Gln Leu Leu Leu Asn Gly Ser Leu
 260 265 270

Ala Glu Glu Glu Val Val Ile Arg Ser Ala Asn Phe Thr Asp Asn Ala
 275 280 285

Lys Thr Ile Ile Val Gln Leu Asn Gln Ser Val Glu Ile Asn Cys Thr
 290 295 300

Arg Pro Asn Asn Asn Thr Arg Lys Ser Ile Arg Ile Gln Arg Gly Pro
 305 310 315 320

Gly Arg Ala Phe Val Thr Ile Gly Lys Ile Gly Asn Met Arg Gln Ala
 325 330 335

His Cys Asn Ile Ser Arg Ala Lys Trp Asn Asn Thr Leu Lys Gln Ile

340	345	350
Asp Ser Lys Leu Arg Glu Gln Phe Gly Asn Asn Lys Thr Ile Ile Phe 355 360 365		
Lys Gln Ser Ser Gly Gly Asp Pro Glu Ile Val Thr His Ser Phe Asn 370 375 380		
Cys Gly Gly Glu Phe Phe Tyr Cys Asn Ser Thr Gln Leu Phe Asn Ser 385 390 395 400		
Thr Trp Phe Asn Ser Thr Trp Ser Thr Lys Gly Ser Asn Asn Thr Glu 405 410 415		
Gly Ser Asp Thr Ile Thr Leu Pro Cys Arg Ile Lys Gln Ile Ile Asn 420 425 430		
Met Trp Gln Glu Val Gly Lys Ala Met Tyr Ala Pro Pro Ile Ser Gly 435 440 445		
Gln Ile Arg Cys Ser Ser Asn Ile Thr Gly Leu Leu Leu Thr Arg Asp 450 455 460		
Gly Gly Asn Ser Asn Asn Glu Ser Glu Ile Phe Arg Pro Gly Gly Gly 465 470 475 480		
Asp Met Arg Asp Asn Trp Arg Ser Glu Leu Tyr Lys Tyr Lys Val Val 485 490 495		
Lys Ile Glu Pro Leu Gly Val Ala Pro Thr Lys Ala Lys Arg Arg Val 500 505 510		
Val Gln Arg Glu Lys Arg Ala Val Gly Ile Gly Ala Leu Phe Leu Gly 515 520 525		
Phe Leu Gly Ala Ala Gly Ser Thr Met Gly Ala Ala Ser Met Thr Leu 530 535 540		
Thr Val Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln Asn 545 550 555 560		
Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln Leu Thr 565 570 575		

Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Ile Leu Ala Val Glu Arg
580 585 590

Tyr Leu Lys Asp Gln Gln Leu Leu Gly Ile Trp Gly Cys Ser Gly Lys
595 600 605

Leu Ile Cys Thr Thr Ala Val Pro Trp Asn Ala Ser Trp Ser Asn Lys
610 615 620

Ser Leu Glu Gln Ile Trp Asn Asn Met Thr Trp Met Glu Trp Asp Arg
625 630 635 640

Glu Ile Asn Asn Tyr Thr Ser Leu Ile His Ser Leu Ile Glu Glu Ser
645 650 655

Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp Lys
660 665 670

Trp Ala Ser Leu Trp Asn Trp Phe Asn Ile Thr Asn Trp Leu Trp Tyr
675 680 685

Ile Lys Leu Phe Ile Met Ile Val Gly Gly Leu Val Gly Leu Arg Ile
690 695 700

Val Phe Ala Val Leu Ser Val Val Asn Arg Val Arg Gln Gly Tyr Ser
705 710 715 720

Pro Leu Ser Phe Gln Thr His Leu Pro Ile Pro Arg Gly Pro Asp Arg
725 730 735

Pro Glu Gly Ile Glu Glu Glu Gly Gly Glu Arg Asp Arg Asp Arg Ser
740 745 750

Ile Arg Leu Val Asn Gly Ser Leu Ala Leu Ile Trp Asp Asp Leu Arg
755 760 765

Ser Leu Cys Leu Phe Ser Tyr His Arg Leu Arg Asp Leu Leu Leu Ile
770 775 780

Val Thr Arg Ile Val Glu Leu Leu Gly Arg Arg Gly Trp Glu Ala Leu
785 790 795 800

Lys Tyr Trp Trp Asn Leu Leu Gln Tyr Trp Ser Gln Glu Leu Lys Asn
805 810 815

Ser Ala Val Ser Leu Leu Asn Ala Thr Ala Ile Ala Val Ala Glu Gly
820 825 830

Thr Asp Arg Val Ile Glu Val Val Gln Gly Ala Tyr Arg Ala Ile Arg
835 840 845

His Ile Pro Arg Arg Ile Arg Gln Gly Leu Glu Arg Ile Leu Leu
850 855 860

<210> 6
<211> 23
<212> PRT
<213> retroviral provirus

<400> 6

Asn Asn Thr Arg Lys Ser Ile Arg Ile Gln Arg Gly Pro Gly Arg Ala
1 5 10 15

Phe Val Thr Ile Gly Lys Ile
20

<210> 7
<211> 20
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic oligonucleotide primer

<400> 7
tccccgccttc cagctgtgac 20

<210> 8
<211> 20
<212> DNA
<213> Artificial sequence

<220>
<223> Synthetic oligonucleotide primer

<400> 8
gtgctgctgt gttatgtcct 20

<210> 9

<211> 24
<212> PRT
<213> retroviral provirus

<400> 9

Cys	Asn	Asn	Thr	Arg	Lys	Ser	Ile	Arg	Ile	Gln	Arg	Gly	Pro	Gly	Arg
1				5					10					15	

Ala	Phe	Val	Thr	Ile	Gly	Lys	Ile
			20				